Read me first

1. The "**LOAD SETUP DEFAULTS**" function loads the system default data directly from ROM and initializes the associated hardware properly. This function is necessary when you accept this mainboard, or the system CMOS data will corrupt.

```
ROM PCI/ISA BIOS
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP          SUPERVISOR PASSWORD
BIOS FEATURES SETUP          USER PASSWORD
CHIPSET FEATURES SETUP       IDE HDD AUTO DETECTION
POWER MANAGEMENT SETUP       HDD LOW LEVEL FORMAT
PNP/PCI  CONFIGURA             ┌──────────────────────────┐ ETUP
                              │ Load SETUP Default (Y/N)? Y │
INTEGRATED PERIPH             └──────────────────────────┘ AVING
LOAD SETUP DEFAULTS

ESC: QUIT                    ↑↓→←   :SELECT ITEM
F10:Save & Exit Setup        (Shift)F2  :Change Color

Load Setup Defaults Except Standard COMS SETUP
```

LOAD SETUP DEFAULT

2. **KBPO(KeyBoard Power On)** Function : There is a basic requirement that the " **+5V SB** " power of the ATX power supply must be > = $0.1A$ **(100mA).** Please refer to chapter 2-5 for detail.

Apollo MVP3 AGPset

EP-51MVP3E-M

ISA/PCI/AGP MainBoard

with Onboard PCI IDE and Super Multi-I/O.

TRADEMARK

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The specification is subject to change without notice.

V105

Package Checklist

Please check your package which should include all items listed below. If you find any item damaged or missed, please contact your supplier.

- One mainboard
- One manual
- One IDE ribbon cable
- One floppy ribbon cable
- One AGP driver diskette
- One Ultra_DMA IDE driver diskette

Contents

Chapter 1
Introduction

This mainboard is a high performance system hardware based on Intel Pentium processor and is equipped with an AGP slot, four PCI slots, three standard ISA slots, Super Multi-I/O controller and dual port PCI-IDE connectors for the future expansion. The hardware dimension is 305mm x 230mm with a four-layer-design technology.

Specification

- VIA Apollo MVP3 AGP/PCIset chipset.

- Intel **Pentium** Processor, Pentium Processor with MMX technology, AMD K5/K6, Cyrix 6x86L/6x86MX & idt C6 operating at **120 ~ 500 MHz** with **321 ZIF socket 7** provides scalability to accept faster Processors in the future.

- Supports up to 384 MegaBytes of memory (168-Pin DIMM SOCKET x 3 and 72-Pin SIMM SOCKET x 2).

- Supports 1 MB (Pipelined Burst SRAM) L2 **Cache**

- Supports three 16 bit ISA slots ,four 32 bit PCI slots and an AGP slot and provides two independent high performance PCI IDE interfaces capable of supporting **PIO Mode 3/4 and *Ultra-DMA33*** devices

- Supports **ATAPI** (e.g. **CD-ROM**) devices on both IDE interfaces.

- Supports a floppy port, a parallel port (EPP,ECP port), two serial ports (16550 Fast UART compatible), 2 USB Ports, a PS/2 style mouse connector and a PS/2 style keyboard connector.

- Supports Award Plug & Play BIOS.

- Supports CPU Hardware sleep, APM (Advanced Power Management) and *ACPI (Advanced Configuration Power Interface)*.

- Supports an *ATX power supply* connector for a *Remote On/Off*, a *Phone-Ring Power On* and a *Keyboard Power On* Function.

- Supports *Switching Regulator* for CPU power supply and *single jumper for CPU working voltage selection*

- *Supports ESDJ (Easy Setting Dual Jumper) function for CPU selection.*

- *Support hardware monitor function.*

Chapter 2
Hardware design

2-1 Mainboard Layout

This mainboard is designed with VIA Apollo MVP3 AGP/PCIset chipset which is developed by VIA Corporation to fully support Pentium Processor PCI/ISA system. By providing a massive increase in the bandwidth available between the video card and the processor (66MHz), the unique feature of AGP supported by VIA Apollo MVP3 chipset improves the speed of rendering and texturing for 3D graphics.The chipset also provides an integrated IDE controller with two high performance IDE interfaces for up to four IDE devices (hard devices, CD-ROM device, etc) The Winbond W83877TF Super I/O controller provides the standard PC I/O function: one floppy interface, two 16 Byte FIFO serial ports and one EPP/ECP capable parallel port. This mainboard layout is shown in the next page for user's reference. **Care must be taken** when inserting memory modules, CPUs or even plugging PCI card into associated slots to avoid damaging any circuits or sockets on board. A cooling fan is strongly recommended when installing Pentium/Pentium MMX/K5/K6/6x86/6x86L/6x86MX/C6 processor due to possible overheat.

This mainboard supports a minimum of 8MB and a maximum of 384MB of System Memory while Onboard 1MB cache to increase system performance.

This mainboard supports standard Fast Page, EDO (Extended Data Out or Hyper Page Mode) or synchronous DRAM **This mainboard** provides three 168-pin DIMM sites for memory expansion. The sockets support 1M x 64(8MB), 2M x 64 (16MB), 4M x 64(32MB), and 8M x 64(64MB) single-sided or double-sided memory modules The memory timing requires 70 ns Fast page devices or 60 ns EDO DRAM (DRAM Modules may be parity [x 36] or non-parity [x 32].

This mainboard supports **two Onboard PCI IDE** connectors, and automatically detects IDE harddisk type by BIOS utility automatic

This mainboard supports Award Plug & Play BIOS for the ISA and PCI cards. The BIOS can be located in Flash EPROM which can replace BIOS code easily if necessary.
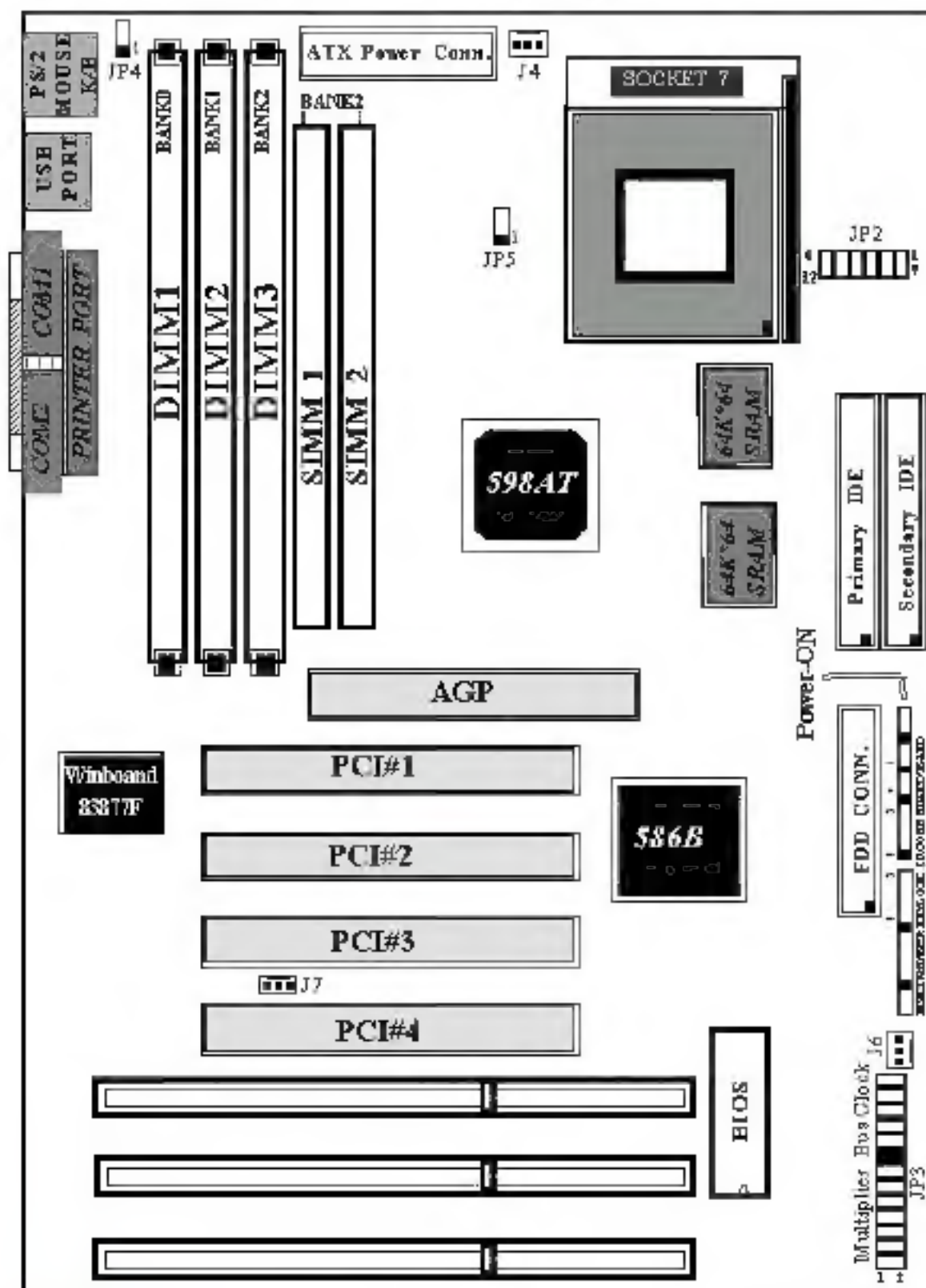
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EP-51MVP3E-M Layout

Figure 2-1

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2-2 Connectors and Jumpers

This section describes the connectors and jumpers equipped in the mainboard
Please refer to **Figure 2-1** for the location of each connector and jumper

JP3

1   2

Multiplier
- 2X
- 2.5X
- 3X
- 3.5X
- 4X
- 4.5X
- 5X

Bus CLOCK
- 60MHz
- 66MHz
- 75MHz
- 83MHz
- 95MHz
- 100MHz

25 26

Pentium / MMX AMD K5 / K6 idt - C6	JP3 Multiplier	Bus CLOCK	Cyrix / IBM 6x86L/MX M II
166MHz	2.5 x	66MHz	MX-PR200
		75MHz	M II/MX-PR233
		83MHz	M II/MX-PR266
250MHz		100MHz	M II/MX-PR333
200MHz	3 x	66MHz	M II/MX-PR233
		75MHz	M II/MX-PR300
250MHz		83MHz	M II/MX-PR333
300MHz		100MHz	M II/MX-PR350
233MHz	3.5 x	66MHz	M II/MX-PR300
		75MHz	M II/MX-PR333
		83MHz	M II/MX-PR350
333MHz		95MHz	
350MHz		100MHz	
266MHz	4 x	66MHz	M II/MX-PR333
		75MHz	M II/MX-PR350
333MHz		83MHz	
400MHz		100MHz	
300MHz	4.5 x	66MHz	
450MHz		100MHz	
333MHz	5 x	66MHz	
500MHz		100MHz	

JP2 : CPU Vcore voltage selection : For Pentium Processor with MMX technology, AMD K6 and Cyrix 6x86L / 6x86MX / M II

6   12

- 6-12 : 3 2V for AMD K6-PR2-233MHz
- 5-11 : 2.9V for AMD K6-PR2-166/200MHz and Cyrix 6x86MX/MII
- 4-10 : 2.8V for Pentium MMX and Cyrix 6x86L
- 3-9   : 2.4V Reserved
- 2-8   : 2.2V for AMD K6 3D CPUs
- 1-7   : 2.1V Reserved

1   7

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J2

Reset Switch - Closed to restart system.

Speaker - connect to the system's speaker for beeping.
1 Speaker
2. N/C
3 GND
4 VCC

KeyLock - Keyboard lock switch & Power LED connector.
1 Power LED(+)
2 N/C
3 GND
4 Key-Lock
5 GND

J3

LrDA/ASK IR CONNECTOR
1 VCC
2 NC
3 IRRX
4 GND
5. IRTX

IDE LED indicator - LED ON when harddisks activate

Turbo LED indicator - LED ON when higher speed is selected.
There is no deturbo function so that the turbo LED is always ON

Power-ON - Push the button to turn on the system
    - Pressing less than 4 seconds to enter the suspend mode
    - Pressing more than 4 seconds to turn off the system

J4   **CPU FAN Connector**

J6   **CHASSIS FAN Connector**

J7   **WOL (Wake-up On Lan) Connector**

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2-3 System Memory Configuration

This mainboard supports different type of settings for the system memory. The following figures and table provides all possible memory combinations.

DIMM 1 BANK 0	DIMM 2 BAMK 1	DIMM 3 or SIMM1&2 BANK 2	TOTAL MEMORY
8MB 16MB 32MB 64MB 128MB ×1	8MB 16MB 32MB 64MB 128MB ×1	8MB 16MB 32MB 64MB 128MB ×1 or 8MB 16MB 32MB ×2	MAX.=384MB

This mainboard supports 2 kinds of powerful and flexible SDRAM frequency selections. These can be synchronous with CPU bus clock or fixed as 66MHz. By implementing the VCS (Virtual Clock Synchronization) technology, this mainboard refers to the use of delay-lock-loop (DLL) to enable synchronous and pseudo-synchronous operation of the processor and DRAM, AGP and PCI buses, The JP5 allows user to set the SDRAM Frequency between 66/100MHz

JP5   ***SDRAM Clock Selection***
1-2 : Fixed as 66MHz
2-3 : SDRAM Clock = CPU Bus Clcok

Jumper's position:
1-2 : Pseudo-synchronous Status(Fixed as 66MHz)
A more stable and compatible operation condition for non-100MHz based SDRAM when you are using 100MHz based CPU. This setting is suitable for those users who are like to remain the usage of current SDRAM module.

2-3 : Synchronous Status(SDRAM Clock= CPU Bus Clock)
Increasing the bus speeds from the traditional 66MHz to 100MHz greatly improves system performance because the speed at which data traveling between the CPU and memory is increased by 50%. However, there is one thing you should bear in mind. *Please make sure you are using 125MHz(-8) based or above SDRAM module.*

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2-4 ATX Power ON OFF Control

This mainboard equips an ATX power connector which is a single 20-PIN input device for an ATX power supply (see Figure 2-2). An ATX power supply provides a built-in Remote Power ON/OFF function. To implement the function, a momentary switch which is normally open should be connected to the position J3(PIN 12-13) as the system's power ON/OFF button. Note that an AT power supply does not offer this function.

Based on the ATX power connector, this mainboard has been designed to support both *ACPI and Soft OFF functions. According to the definition of ACPI, a Suspend mode will be enabled while you push the J3(system power ON/OFF) button less than 4 seconds. Nevertheless, the system will be turned off by pressing for more than 4 seconds. Regarding the Soft-OFF (coming from this mainboard onboard circuit controller, it* is another way to turn off your system. Your system can be shut down automatically by an operation system such as Windows 95
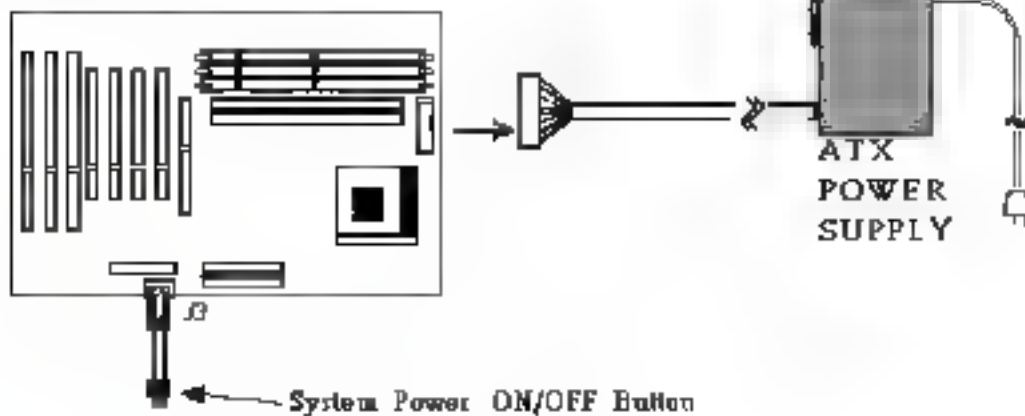
EP-51MVP3E-M
BOARD

Figure 2-2. Simple ATX Power ON/OFF Controller

## 2 5 External Modem Ring-in Power ON and Keyboard Power ON

On the basis of bounded functions in I O chipset. the two serial ports are able to support the External Modem Ring-in Power ON function Once users connect the external modem to COM or COM2. this mainboard mainboard allows users to turn on their system through the remote and host s dial-up control.

Exclusive Keyboard Power ON Function

To innovate a unique feature to benefit users. we devoted ourse ves to create the easiest and most convenient way to turn on your system based on the the ATX power supply This function s available only under system being connected to ATX power supply

How to work with it

Step 1, Please place JP4 at the position 2 3 after you finished the system installation.

JP4   3   *Keyboard Power-ON Function Selection*
                    1 2   *Disabled*
                    2 3 *Enabled*
          1
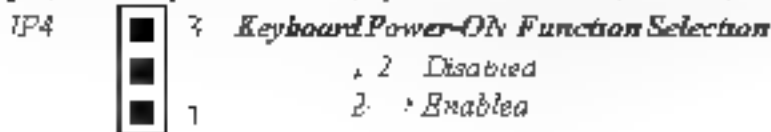
Step 2 Push the momentary switch to turn on your system and then push again to hold for more than 4 seconds to turn it off as soon as you turn it n

Step 3. You can enjoy the Keyboard Power ON function by *pressing any 1 or 2 keys on you keyboard at the same time for 1 2 seconds* Your system will be turned on automatically after releasing the keys To power off you system. you can use the Soft-OFF function under Windows 95

Notes
    1 The number of keys needed to turn on a system depends on the model of keyboard you are applying due to different oadings on different keyboards Here, we would like to suggest you push 2 keys at the same time
    2 Inte ATX version 2 0 specification has recommended you use the power supply with 0 72A(720mA, With our EP 5 MVP3E M mainboard, *the 5 0VSB standby power only has to be > = 0 1A 00mA,* then you can enjoy this unique benefit However the ATX power supply which is < 0 1 00mA is still applicable to your system by placed JP4 at the position 1 2 to disable this feature

2-6 Integrated PCI Bridge

This mainboard adopts **VIA Apollo MVP3 AGP-PCIset** chipset to support Intel Pentium Processor TXISA system. The VIA Apollo MVP3 PCIset chipset consists of the 82C598AT system controller (TSC), and one 82C586B PCI-ISA/IDE Accelerator bridge chip. It provides an interface which translates CPU cycle into PCI bus cycle, and PCI burst read/write capability. In addition, it provides high performance PCI arbiter to support four PCI Masters, Rotating Priority Mechanism, and Hidden Arbitration Scheme Minimizes Arbitration Overhead.

There are four interrupts in each PCI slot: INTA#, INTB#, INTC#, and INTD#. Since this mainboard adopts the PCI auto-configuration with the system BIOS Setup utility. When the system is turned on after adding a PCI add-in card, the BIOS automatically configure interrupts, DMA channels, I/O space, and other parameters. You do not have to configure jumpers or worry about potential resource conflicts. Because PCI cards use the same interrupt resource as ISA cards, you must specify the interrupt used by ISA add-in cards in the BIOS Setup utility.

However, if a "Legacy card", such as plugging a paddle card and cable into an ISA slot, is plugged in the system, modification of the **ROM SETUP UTILITY** becomes necessary. First of all, you must enter **PCI CONFIGURATION SETUP** utility from the **ROM SETUP UTILITY** main menu to set "ISA" for the "PCI IDE IRQ MAP TO".

Secondly, you must enter the **CHIPSET FEATURES SETUP UTILITY** from the **ROM SETUP UTILITY** main menu and set "Disabled" for the "Onboard Primary PCI IDE and the **Onboard Secondary PCI IDE**. When you plug ISA/ISA IDE cards into the system, you should select "Disabled" for the **Onboard Primary and Secondary PCI IDE** item on the **CHIPSET FEATURES SETUP UTILITY** too.

You can set the system interrupt request IRQ on some "Legacy cards" which have an paddle card and cable. refer to users manual of the card or a proper system chip level. In general, card's Primary is assigned to INTA and Secondary is assigned to INTB. If the card is plugged into slot 1 marked PCI#1, you cannot use second slot (marked PCI#2) because the Secondary INT signal takes INTB from the slot (refer to Page 3-12 for circuit diagram). The user then enters the **PCI CONFIGURATION SETUP** utility from the **ROM SETUP UTILITY** main menu and set "PCI-Slot 1" for the "PCI IDE IRQ MAP TO (This depends on the slot # where the Legacy card is plugged).

CHAPTER 3
AWARD BIOS SETUP

Award's ROM BIOS provides a built-in setup program which allows user to modify the basic system configurations and hardware parameters. The modified data will be stored in a battery-backed CMOS RAM so that data will be retained even when the power is turned off. In general, the information saved in the CMOS RAM stays unchanged unless there is a configuration change in the system, such as a hard drive replacement or a new device installation.

If this does happen, you will need to reconfigure your configuration parameter.

To Enter Setup Propgram

Power on the computer and press <**Del**> key immediately. This will bring you into BIOS **CMOS SETUP UTILITY**.

```
ROM PCI/ISA BIOS(2A5LEPA9)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP          SUPERVISOR PASSWORD
BIOS FEATURES SETUP          USER PASSWORD
CHIPSET FEATURES SETUP       IDE HDD AUTO DETECTION
POWER MANAGEMENT SETUP       HDD LOW LEVEL FORMAT
PNP/PCI CONFIGURATION        SAVE & EXIT SETUP
INTEGRATED PERIPHERALS       EXIT WITHOUT SAVING
LOAD SETUP DEFAULTS

ESC : QUIT                   ↑↓ → ←   SELECT ITEM
F10   Save & Exit Setup      (Shift)F2   Change Color

Time, Date, Hard Disk Type
```

Figure 3-1 CMOS SETUP UTILITY

The menu displays all major selection items. Select the item you need to reconfigure. The selection is made by moving cursor (press any direction key) to the item and press the Enter key. An on-line help message is displayed at the bottom of the screen as the cursor is moving to various items which provides a better understanding of each function. When a selection is made, the menu of selected item will appear so the user can modify the associated configuration parameters.

3-1 STANDARD CMOS SETUP

Choose "**STANDARD CMOS SETUP**" in the **CMOS SETUP UTILITY** Menu (Fig 3-1,
The **STANDARD CMOS SETUP** allows user to configure system setting such as the
current date and time. type of hard disk installed floppy type and display type Memory
size is auto deterted by the BIOS and displayed for your reference When a field s
highlighted use direction keys to move cursor and <Enter> key to select, the entries in
the field will be changed by pressing <PgDn> or <PgUp> keys or user can enter new data
directly from the keyboard

```
            ROM PCI/ISA BIOS(2A5LEPA9)
                STANDARD CMOS SETUP
                AWARD SOFTWARE, INC.

  Date (mm:dd:yy)   Wed, Jan  5  998
  Time (hh:mm:ss)   4  30  50

  HARD DISKS     TYPE   SIZE  CYLS  HEAD  PRECOMP  LANDZONE  SECTORS  MODE
  Primary Master   Auto   0    0     0     0        0        0       Auto
  Primary Slave    Auto   0    0     0     0        0        0       Auto
  Secondary Master Auto   0    0     0     0        0        0       Auto
  Secondary Slave  Auto   0    0     0     0        0        0       Auto

  Drive A    44M,3.5 in
  Drive B    None                   Base  Memory       640K
  Floppy 3 mode Support  Disable    Extended Memory  15360K
  Video    EGA/VGA                  Other Memory       384K
  Halt On  All Errors
                                    Total Memory     16384K

  ESC   Quit          ↑ ↓ → ←   Select Item        PU/PD/+/-  Modify
  F1    Help          (Shift) F2  Change Color
```

Figure 3-2 STANDARD CMOS SETUP

NOTE: If the Primary Master/Slave and the Secondary Master/Slave are set as
"Auto   the hard disk size and model will be auto-detected.

NOTE: The '**Halt On** ' field is to determine when to halt the system by the BIOS if an error
occurs

3-2 BIOS FEATURES SETUP

By selecting the "**BIOS FEATURES SETUP**" option in the **CMOS SETUP UTILITY**
menu user can change system related parameters in the displayed menu This menu
shows all of the manufacturer s default values of this mainboard Again. user can move
the cursor by pressing direction keys and <PgDn> or <PgUp> keys to modify the
parameters Pressing F   key to display help message of the selected item

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```
                    ROM PCI/ISA BIOS(2A5LEPA9)
                       BIOS FEATURES SETUP
                       AWARD SOFTWARE, INC.

  Virus Warning           Disabled   Video BIOS     Shadow      Enabled
  CPU Internal Cache      Enabled    C8000-CBFFF    Shadow      Disabled
  External Cache          Enabled    CC000-CFFFF    Shadow      Disabled
  Quick Power On Self Test Enabled   D0000-D3FFF    Shadow      Disabled
  Boot Sequence           A, C, SCSI D4000-D7FFF    Shadow      Disabled
  Swap Floppy Drive       Disabled   D8000-DBFFF    Shadow      Disabled
  Boot Up Floppy Seek     Enabled    DC000-DFFFF    Shadow      Disabled
  Boot Up NumLock Status  On         Diskette Access For        All
  Boot Up System Speed    High
  Gate A20 Option         Fast
  Memory Parity/ECC Check Disabled
  Typematic Rate Setting  Disabled
  Typematic Rate (Char/Sec 6
  Typematic Delay (Msec   250        Esc  Quit            ↑ ↓ ← → Select Item
  Security Option         Setup      F1   Help            PU/PD+/- Modify
  PCI/VGA Palette Snoop   Disabled   F5   Old Values      (Shift)F2 Color
  OS Select For DRAM > 64MB Non-OS2  F7   Load Setup Defaults
```

Figure 3-3 BIOS FEATURES SETUP

Note The **Security Option** contains "**setup**" and "**system**" The "**setup**" indicates that the password setting is for CMOS only while the "**system**" indicates the password setting is for both CMOS and system boot up

- **Virus Warning:** This category flashes on the screen During and after the system boots up, any attempt to write to the boot sector or partition table of the hard disk drive will halt the system and an error message will appear You should then run an anti-virus program to locate the virus Keep in mind that this feature protects only the boot sector not the entire hard drive Default value is Disabled.

  Enabled Activates automatically when the system boots up causing a warning message to appear when any attempt to access the boot sector or hard disk partition table

  Disabled No warning message to appear when any attempt to access the boot sector or hard disk partition table

- **CPU Internal Cache External Cache:** These two categories speed up memory access However it depends on CPU/chipset design The default value is Enabled If your CPU is without Internal Cache then this item "CPU Internal Cache" will not be shown

  Enabled   Enable cache

  Disabled Disable cache

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- **Quick Power On Self Test:** This category speeds up Power On Self Test (POST) after you power on the computer. If it is set to Enable, BIOS will shorten or skip some checking items during POST.
  Enabled: Enable quick POST
  Disabled: Normal POST

- **Boot Sequence:** This category determines which drive is searched first for the O/S (Operating System). The default value is A,C.
  A,C: The system will search for floppy disk drive first then hard disk drive
  C,A: The system will search for hard disk drive first then floppy disk drive

- **Swap Floppy Drive:** This will swap your physical drive letters A&B if you are using two floppy disks. The default value is Disabled.
  Enabled: Floppy A & B will be swapped under the O/S
  Disabled: Floppy A & B will be not swapped

- **Boot Up Floppy Seek:** During Power On Self Test (POST) BIOS will determine if the installed floppy drive is 40 or 80 tracks. Only 360K type is 40 tracks while 760K, 1.2M and 1.44M are all 80 tracks. The default value is Enabled.
  Enabled: BIOS searches for floppy disk drive to determine if it is 40 or 80 tracks. Note that BIOS cannot tell from 720K, 1.2M or 1.44M drive type as they are all 80 tracks
  Disabled: BIOS will not search for the type of floppy disk drive by track number. Note that there will not be any warning message if the drive installed is 360K

- **Boot Up NumLock Status:** The default value is On.
  On: Keypad is number keys
  Off: Keypad is arrow keys

- **Boot UP System Speed:** Select default system speed. The system will run at the selected speed after the system boots
  High: Set the speed to high
  Low: Set the speed to low

- **Gate A20 Option:** This refers to the way the system addresses memory above 1MB extended memory. The default value is Fast.
  Normal: The A20 signal is controlled by keyboard controller or chipset hardware
  Fast: The A20 signal is controlled by Port 92 or chipset specific method

- **Typematic Rate Setting:** This determines the typematic rate

  Enabled: Enable typematic rate and typematic delay programming.

  Disabled: Disable typematic rate and typematic delay programming. The system BIOS will use default value of 2 items and the default is controlled by the keyboard

- **Typematic Rate(Chars/Sec):**

  6   6 characters per second.   8   8 characters per second
  10: 10 characters per second.   12 12 characters per second
  15: 15 characters per second.   20: 20 characters per second
  24: 24 characters per second.   30: 30 characters per second

- **Typematic Delay(Msec.:** This determines the time between the first and second character displayed, when holding a key

  250   250msec
  500   500 msec
  750   750 msec
  000: 1000 msec

- **Security Option:** This category allows you to limit access to the system and Setup, or just to Setup. The default value is Setup

  System: The system will not boot and the access to Setup will be denied if the correct password is not entered at the prompt

  Setup: The system will boot but the access to Setup will be denied if the correct password is not entered at the prompt

- **PCI VGA Palette Snoop:** This filed controls the ability of a primary PCI VGA controller to share a common palette, when a snoop write cycles with an ISA video card. The default value is Disabled

  Enabled: If an ISA card connects to a PCI VGA card via the VESA connector and the ISA card connects to VGA monitor and uses the RAMDAC of PCI card. the PCI/VGA Palette Snoop is enabled

  Disabled: Disable the VGA card Palette snoop function

- **Video BIOS Shadow:** It determines whether video BIOS will be copied to RAM However it is optional from chipset design. Video Shadow will increase the video speed

  Enabled: Video shadow is enabled.
  Disabled: Video shadow is disabled

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◆ C8000   CBFFF Shadow
  CC000   CFFFF Shadow
  D0000   D3FFF **Shadow**
  D4000   D7FFF **Shadow**
  D8000   DBFFF Shadow
  DC000   DFFFF Shadow

These categories determine whether optional ROM will be copied to RAM by 16K byte or 32K byte per unit and the size depends on the chipset

Enabled   Optional shadow is enabled

Disabled: Optional shadow is disabled

3-3 CHIPSET FEATURES SETUP

Choose the "**CHIPSET FEATURES SETUP**" in the **CMOS SETUP UTILITY** menu to display the following menu

```
ROM PCI/ISA BIOS(2A5LEFA9)
CHIPSET FEATURES SETUP
AWARD SOFTWARE, INC.

Bank 0/1 DRAM Timing       60 ns    System/CPU Warning Temp    65C/15 C
Bank 2/3 DRAM Timing       60 ns    Current System Temp        28C/82C
Bank 4/5 DRAM Timing       60 ns    Current CPU Temp           30C/86C
SDRAM Cycle Length         2        Current CPU Fan Speed      0 RPM
SDRAM Bank Interleave      2 Bank   Current Chassis Fan Speed  0 RPM
DRAM Read Pipeline         Enabled  CPU Vcore(V)      3.16V
Sustained 3T Write         Enabled  CPU Vio(V)        3.33V
Cache Rd+CPU WR Pipeline   Enabled  +5V               4.89V
Read Around write          Disabled +12V              1.73V
Cache Timing               Faster    2V               2.26V
Linear Burst               Enabled   5V               5.07V
Video BIOS Cacheable       Enabled
System BIOS Cacheable      Disabled
Memory Hole At  5Mb Addr   Disabled  Esc  Quit          ↑↓ → ←   Select Item
AGP Aperture Size          64M       F    Help          PU/PD+/-  Modify
AGP Transfer Mode           x        F    Old Values    Shift)F2  Color
Cyrix M2 A DS# delay       Enabled   F7   Load Setup Default:
```

Figure 3-4 CHIPSET FEATURES SETUP

Note: When you insert slower memory modules in the system and set a faster timing, maybe the system will hang up

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- **DRAM Timing** The default value is 60ns
    - **60ns** 2 (faster Burst Wait State for 60~70ns Fast Page Mode/EDO DRAM
    - **70ns** 3 s ower Burst Wait State for 70ns Fast Page Mode/EDO DRAM

- **SDRAM Cycle length:** The default value is 2
    - **2** 2 HCLKS
    - **3** 3 HCLKS

- **SDRAM Bank Interleave:** The default value is 2 Bank.
    - **Disabled** Normal Setting
    - **2 Bank/4 Bank:** SDRAM 2 or 4 Bank Interleave

- **DRAM Read Pipeline:** The default value is Enabled
    - **Disabled** Normal Setting
    - **Enabled:** This field enableds the pipelining of DRAM read cycly

- **Sustained 3T Write:** The default value is Enabled
    - **Disabled** Write Back mode L2 Cache
    - **Enabled:** Write Through mode L2 Cache

- **Cache RD+CPU Wt Pipeline:** The default value is Enabled
    - **Disabled** Normal Setting
    - **Enabled:** This field enableds the pipelining of Cache reads and CPU writes cycle

- **Read Around Write:** The default value is Disabled
    - **Disabled** Normal Setting
    - **Enabled:** This field enableds the memory read around write cycle

- **Cache Timing:** The default value is Fastest
    - **Fast** Cache burst mode timing = 3 1 1 2 1 1 1
    - **Fastest:** Cache burst mode timing 3 1 1 1 1 1 1 1

- **Video BIOS Cacheable:** The default value is Enabled.
    - **Enabled** Enabled the Video BIOS Cacheable to speed up the VGA Performance
    - **Disabled:** Disabled the Video BIOS Cacheable function

- **System BIOS Cacheable:** The default value is Disabled
    - **Enabled** Allow caching of the system BIOS ROM at F0000h FFFFFh
    - **Disabled:** Normal Setting

- **Memory Hole at 15M-16M** The default value is Disabled
    - **Disabled:** Normal Setting
    - **Enabled** This field enableds the main memory 5~16MB remap to ISA BUS

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- **AGP Aperture Size:** The amount of the system memory that the AGP card is allowed to share. The options available are 4M, 8M, 16M, 32M, 64M, 128M, 256M. The default value is 64M.

- **AGP Transfer Mode:** The default value is 1X.
  1X   66MHz AGP transfer mode
  2X: 133MHz AGP transfer mode

- **Cyrix M2 ADS# Delay:** The default value is Enabled.
  Disabled   Normal Setting.
  Enabled: Delay 1 HCLK for Cyrix 6x86MX when the ADS# assert

- **System/CPU Warning Temp:** The default value is 66C/151F
  Disabled   Normal Setting.
  Enabled: The options available is 50C/122F   70C/158F

- **Current System Temp:** This is the current temperature of the system

- **Current CPU Temp:** This is the current temperature of the CPU

- **Current CPU Fan Speed:** The current CPU fan speed in RPMs.

- **Current ChassisFan Speed:** The current chassis fan speed in RPMs

- **CPU(V) :** The voltage level of the CPU(Vio/Vcore).

- **+5V   +12V   12V   5V :** The voltage level of the power supply

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3.4 POWER MANAGEMENT SETUP

Choose the **"POWER MANAGEMENT SETUP"** in the **CMOS SETUP UTILITY** to display the following screen. This menu allows the user to modify the power management parameters and IRQ signals. In general, these parameters should not be changed unless it is absolutely necessary.

```
            ROM PCI/ISA BIOS(2A5LEPA9)
            POWER MANAGEMENT SETUP
            AWARD SOFTWARE, INC.

Power Management      User Define     Primary INTR        ON
PM Control by APM     Yes             IRQ3  (COM 2)       Primary
Video off Option      Suspend -> Off  IRQ4  (COM 1)       Primary
Video off Method      V/H SYNC+Blank  IRQ5  (LPT 2)       Primary
Soft-off by PWRBTN    Delay 4 Sec     IRQ6  (Floppy Disk) Disabled
** PM Timers **                       IRQ7  (LPT 1)       Primary
HDD Power Down        Disable         IRQ8  (RTC Alarm)   Disabled
Doze Mode             Disable         IRQ9  (IRQ2 Redir)  Primary
Suspend Mode          Disable         IRQ10(Reserved)     Primary
** PM Events **       IRQ 1           (Reserved)          Primary
VGA                   OFF             IRQ12(PS/2 Mouse)   Primary
LPT & COM             LPT /COM        IRQ13(Coprocessor)  Primary
HDD & FDD             OFF             IRQ14(Hard Disk)    Primary
DMA /master           OFF             IRQ15(Reserved)     Disabled

                              Esc  Quit          ↑ ↓ → ←  Select Item
                              F1   Help          PU/PD+/- Modify
                              F5   Old Value     (Shift)F2 Color
                              F7   Load Setup Defaults
```

Figure 3-5 POWER MANAGEMENT SETUP

Again, users can move the cursor by pressing direction keys to the field needed to be modified and press <PgDn> or <PgUp> to alter item selection. You can only change the content of **Doze Mode**, **Standby Mode** and **Suspend Mode** when the **Power Management** is set to **User Define**.

3.3.1 The Description of the Power Management

A. Power Management mode selection

    Disabled : The system operates in NORMAL conditions (Non-GREEN) and the Power Management function is disabled.

    Max. saving: This mode will maximize the power saving capability.

    Min. saving: This mode will minimize the power saving capability.

    User define: Allow user to define time out parameters to control power saving mode. Refer to item B shown below.

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B. Time-out parameters

HDD Standby

HDD Standby timer can be set from 1 to 15 minutes

System Doze

The "System Doze" mode timer starts to count when there is no "PM events" occurred. The valid time-out setting is from 1 minute up to 1 hour

System Suspend

This function works only when the Pentium Processor is installed. The timer starts to count when "System Standby" mode timer is timed out and no "PM Events" occurred. Valid range is from 1 minute up to 1 hour.

3-3-2   Description of the Green Functions

This mainboard supports HDD Power Down, Doze and Suspend power saving functions. In addition, the hardware suspend function is supported when the J3-12-13 (Refer to Figure2-1) is closed to enter the Suspend function.

The detailed description of these functions is provided in the next page

- **PM Control by APM**

  If Advanced Power Management(APM) is installed on your system, selecting Yes gives better power savings

- **Video Off Method**

  Determines the manner in which the monitor is blanked

V/HSYNC+Blank	System turns off vertical and horizontal synchronization ports and writes blanks to the video buffer
DPMS Support	Select this option if your monitor supports the Display Power Management Signaling (DPMS) standard of the Video Electronics Standards Association (VESA. USE the software supplied for your video subsystem to select video power management values
Blank Screen	System only writes blanks to the video buffer

- **Video off Option**

  Determines when to activate the video off feature for monitor power management. The settings are Video off after Suspend/standby/Doze (N/A)

- **Soft-off by PWRBTN**

  This field is for the soft-off function setting. When the board utilizes an ATX power supply, two types of settings are offered Delay 4 Sec and instant-off. When the setting is Delay 4 Sec, users can power off the system bypressing POWER-ON button(J3) for 4 seconds. However, if users press POWER-ON button for less than 4 seconds, the system will enter the Suspend Mode. When the setting is instant-off, users first press on POWER-ON button will power off the system, but the second press will power on the system

◆ **RTC Alarm Resume**

This option allows you to have the system turn on at a preset time each day or on a certain day. This option is only available when used an ATX power supply.

Enabled The system will turn on at the preset time.

Disabled Normal Setting.

◆ **Date(of month**

This field is to set the date that the system will turn on. The default value is 0.

0 Turn on the system on everyday at the preset time.

1-31 Represets the date of the month that you need the system to turn on.

◆ **Time (hh mm ss)**

This field is to set the time that you need the system to turn on. The default value is 08:00:00

HDD Standby Mode

When system stops reading or writing HDD, the timer starts to count. The system will cut off the HDD power when timer runs out of time. The system will not resume operation until either a read from or a write to HDD command is executed again.

Doze Mode

The system hardware will drop down CPU clock from nomal working speed when Doze mode time out occurs.

Suspend Mode

When the system suspend timer times out, the system will enter the suspend mode and the chipset will stop CPU clock immediately. The power consumption in Suspend Mode is lower than in standby mode. The screen is also blanked out.

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PMEvents:

AWARD BIOS defines 7 PM Events in the power management mode (Doze & suspend) The user can initialize any PM Events to be "Enable" or "Disable" When the system detects all of the enabled events do not have any activity, it will start the system Doze timer first if the "Power Management" is not "Disabled" Once the system Doze timer is timed out it will process doze power saving procedure by starting the system suspend timer When the suspend timer times out all of the CPU clock will stop by dropping system clock down to zero and remains this way until any one of the "Enabled" event occurrs

3-5   PNP/PCI CONFIGURATION

The PNP/PCI configuration program is for the user to modify the PCI/ISA IRQ signals when various PCI/ISA cards are inserted in the PCI or ISA slots

WARNING   Any misplacing IRQ could cause system can't pick out the resources

```
              ROM PCI/ISA BIOS(2A5LEPA9)
               PNP/PCI CONFIGURATION
                AWARD SOFTWARE, INC.

PNP OS Installed         No        PCI Dynamic Bursting      Enabled
Resources Controlled By  Manual    PCI Master 0 WS Write     Enabled
Reset Configuration Data Disabled  PCI Delay Transaction     Enabled
ACPI function            Enabled   PCI Master Read Prefetch  Enabled
IRQ-3   assigned  to     Legacy ISA  PCI#2 Access #1 Retry   Disabled
IRQ-4   assigned  to     Legacy ISA  AGP Master  WS Write    Enabled
IRQ-5   assigned  to     PCI/ISA PnP AGP Master  WS Read     Disabled
IRQ-7   assigned  to     Legacy ISA
IRQ-9   assigned  to     PCI/ISA PnP PCI IRQ Actived By      Level
IRQ-10  assigned  to     PCI/ISA PnP Assign IRQ For USB      Enabled
IRQ-11  assigned  to     PCI/ISA PnP Assign IRQ For VGA      Enabled
IRQ-12  assigned  to     PCI/ISA PnP
IRQ-14  assigned  to     Legacy ISA
IRQ-15  assigned  to     Legacy ISA

                                    ESC   Quit          ↑↓→←  Select Item
                                    F1    Help      PU/PD/+/- Modify
                                    F5    No Change  (Shift)F2 Color
                                    F7    Load Setup Defaults
```
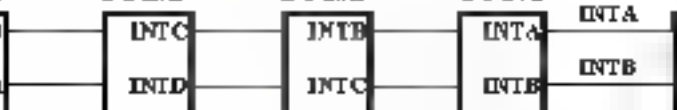
Figure3-6 PCI CONFIGURATION SETUP

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* **Resource Controlled By** The default value is Manual

   Manual   The field defines that the PNP Card's resource is controlled by manual. You can setup whether IRQ-X or DMA-X is assigned to PCI/ISA PNP or Legacy ISA Cards

   Auto: If your ISA card and PCI card are all PNP cards. Set this field to "Auto". The BIOS will assign the interrupt resource automatically

* **Reset Configuration Data:** The default value is Disabled

   Disabled: Normal Setting

   Enabled: If you plug some Legacy cards in the system and record into ESCD Extended System Configuration Data, You can set this field to be Enabled and to clear ESCD at one time, when some Legacy cards are removed

* **PCI IDE IRQ Map To:** The default value is PCI AUTO

   When you have true PCI card(s) plugged into the system, you will not need to change any thing here in the **SETUP** program. However if you do not know whether you are using a true PCI card please refer to your PCI card user's manual for the details

   When you have a Legacy card described in section 2.5 to plug into the system, a proper setting is extremely important or it may cause the system hung up. The diagram shown below tells you how the Rotating Priority Mechanism is designed

Figure 3-7 The Combination of PCI INT# lines

3-6   INTEGRATED PERIPHERALS

```
          ROM  PCI/ISA  BIOS(2A5LEPA9)
              INTEGRATED PERIPHERALS
               WARD  SOFTWARE, INC.

 Onboard Primary PCI IDE      Enabled    Onboard Parallel Port      378/IRQ7
 Onboard Secondary PCI IDE    Enabled    Onboard Parallel Mode      ECP EPP
 IDE Prefetch Mode            Enabled    ECP Mode Use DMA           3
 IDE HDD Block Mode           Enabled    Parale Port EPP Type       EPP  9
 IDE primary Master PIO       Auto       OnChip USB                 Disabled
 IDE Primary Slave PIO        Auto
 IDE Secondary Master PIO     Auto
 IDE Secondary Slave PIO      Auto
 IDE Primary Master UDMA      Auto
 IDE Primary Slave UDMA       Auto
 IDE Secondary Master UDMA    Auto
 IDE Secondary Slave UDMA     Auto
 PCI IDE Secondary Channel    Enabled

 Onboard FDD Controller       Enabled   ESC   Quit          ↑↓ ←→   Select Item
 Onboard Serial Port 1        Auto      F1    Help          PU/PD/+ Modify
 Onboard Serial Port 2        Auto      F5    No Change     (Shift) F2  Color
 UART 2 Mode                  Standard  F7    Load Setup Defaults
```

Note: If you don't use the Onboard IDE connector, but use On-card
(PCI or ISA card) IDE connector. You have to set Onboard Primary
PCI IDE: Disabled and Onboard Secondary PCI IDE: Disabled
from CHIPSET FEATURES SETUP UTILITY
The Onboard PCI IDE cable should be **equal to or less than**
18 inches (45 cm.).

- **IDE HDD Block Mode**: The default value is Enabled
  Enabled: Enabled IDE HDD Block Mode. The HDD transfer rate is better than
  Disable
  Disabled: Disable IDE HDD Block Mode

- **PCI Slot IDE 2nd Channel**: The default value is Enabled
  Enabled: Enable secondary IDE port and BIOS will assign IRQ15 for this port
  Disabled: Disable secondary IDE port and IRQ 15 is available for other device

- **Onboard Primary PCI IDE**: The default value is Enabled
  Enabled: Enable Onboard 1st channel IDE port
  Disabled: Disable Onboard 1st channel IDE port. When use On-card (PCI or ISA
  card) IDE connector

- **Onboard Secondary PCI IDE**: The default value is Enabled
  Enabled: Enable Onboard 2nd channel IDE port
  Disabled: Disable Onboard 2nd channel IDE port. When use On-card (PCI or ISA
  card) IDE connector

- **IDE Primary Master PIO** The default value is Auto

  Auto   BIOS will automatically detect the Onboard Primary Master PCI
                   IDE HDD Accessing mode

  Mode0~4   Manually set the IDE Accessing mode

- **IDE Primary Slave PIO** The default value is Auto

  Auto   BIOS will automatically detect the Onboard Primary Slave PCI IDE
                   HDD Accessing mode

  Mode0~4   . Manually set the IDE Accessing mode

- **IDE Secondary Master PIO** The default value is Auto

  Auto   BIOS will automatically detect the Onboard Secondary Master PCI
                   IDE HDD Accessing mode

  Mode0~4   . Manually set the IDE Accessing mode

- **IDE Secondary Slave PIO** The default value is Auto

  Auto   BIOS will automatically detect the Onboard Secondary Slave PCI
                   IDE HDD Accessing mode

  Mode0~4   . Manually set the IDE Accessing mode

- **Onboard FDC Controller** The default value is Enabled

  Enabled   Enable the Onboard floppy drive interface controller

  Disabled   Disable the Onboard floppy drive interface controller
                   When using On-card ISA FDC''s controller

- **Onboard UART 1** This field allows the user to sellect the serial port The default
  value is 3F8H/IRQ4

  COM1 Enable Onboard Serial port 1 and address is 3F8H/IRQ4
  COM2 Enable Onboard Serial port 1 and address is 2F8H/IRQ3
  COM3 Enable Onboard Serial port 1 and address is 3E8H/IRQ4
  COM4 Enable Onboard Serial port 1 and address is 2E8H/IRQ4
  Disabled Disable Onboard Serial port 1

- **Onboard UART 2** This field allows the user to sellect the serial port The default
  value is 2F8H/IRQ3

  COM1 Enable Onboard Serial port 2 and address is 3F8H/IRQ4
  COM2 Enable Onboard Serial port 2 and address is 2F8H/IRQ4
  COM3 Enable Onboard Serial port 2 and address is 3E8H/IRQ4
  COM4 Enable Onboard Serial port 2 and address is 2E8H/IRQ3
  Disabled Disable Onboard Serial port 2

- **Onboard UART 2 Mode**: The default value is standard. This field allows the User to select the COM2 port that can support a serial Infrared Interface

  Standard: Support a Serial Infrared Interface IrDA

  HPSIR Support a HP Serial Infrared Interface format

  ASKIR: Support a Sharp Serial Infrared Interface format

- **Onboard Parallel port**: This field allows the user to select the LPT port. The default value is 378H/IRQ7

  378H - Enable Onboard LPT port and address is 378H and IRQ7

  278H Enable Onboard LPT port and address is 278H and IRQ5

  3BCH - Enable Onboard LPT port and address is 3BCH and IRQ7

  Disabled - Disable Onboard LPT port

  NOTE: **Parallel Port address is 378H/3BCH that selects the routing of IRQ7 for LPT1**
  Parallel Port address is 278H that selects the routing of IRQ5 for LPT1.

- **Parallel port Mode** This field allows the user to select the parallel port mode default value is ECP+EPP

  Normal Standard mode. IBM PC/AT Compatible bidirectional parallel port

  EPP Enhanced Parallel Port mode

  ECP Extended Capability Port mode

  EPP+ECP ECP Mode & EPP Mode

  ECP Mode USE DMA. This field allows the user to select DMA1 or DMA for the ECP mode. The default value is DMA3

  DMA1 The filed selects the routing of DMA1 for the ECP mode

  DMA3 - The filed selects the routing of DMA3 for the ECP mode

---

3-7 LOAD SETUP DEFAULTS

The "LOAD SETUP DEFAULTS" function loads the system default data directly from ROM and initializes the associated hardware properly. This function will be necessary only when the system CMOS data is corrupted

```
              ROMPCI/ISA BIOS(2ASLEPA9)
                   CMOS SETUP UTILITY
                 AWARD SOFTWARE, INC.

   STANDARD CMOS SETUP          SUPERVISOR PASSWORD

   BIOS FEATURES SETUP          USER PASSWORD

   CHIPSET FEATURES SETUP       DEF HDD AUTO DETECTION

   POWER MANAGEMENT SETUP       HDD LOW LEVEL FORMAT

   PNP/PCI CONFIG RA┌─────────────────────────┐ETUP
                    │  Load SETUP Default (Y/N)? Y │
   INTEGRATED PERIPH└─────────────────────────┘AVING
   LOAD SETUP DEFAULTS

   ESC QUIT                 ↑↓ →←   SELECT ITEM
   F10:Save & Exit Setup        Shift/F2  Change Color
        Load Setup Defaults Except Standard COMS SETUP
```
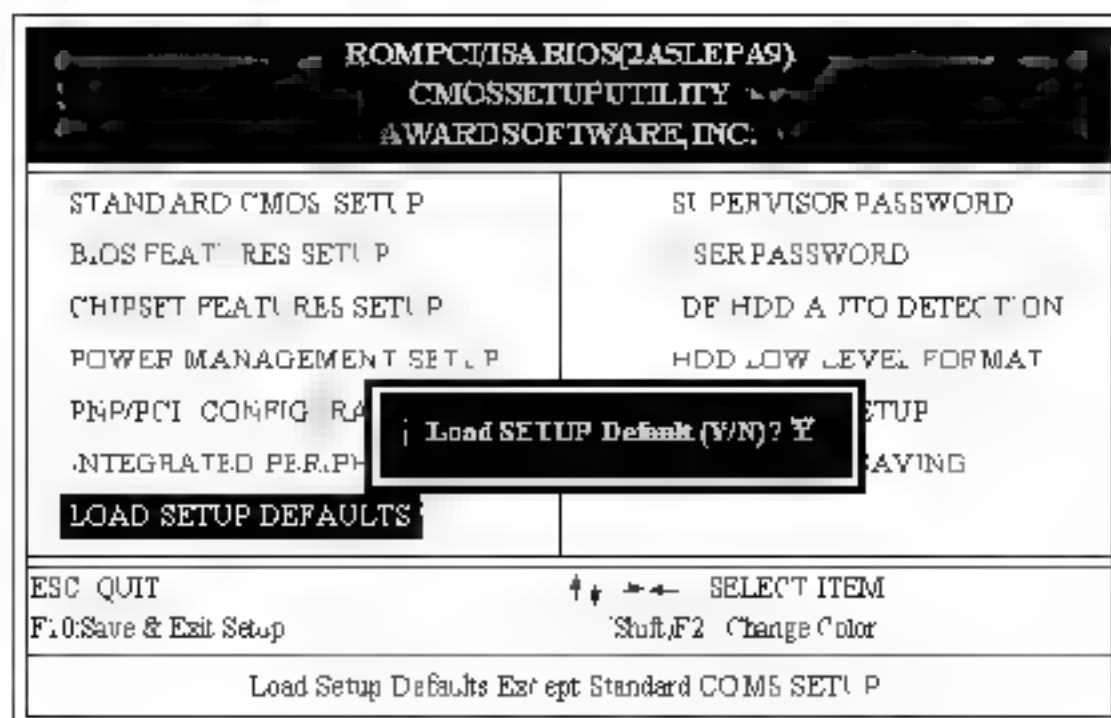
Figure 3-8 LOAD SETUP DEFAULT

3-8   CHANGE SUPERVISOR or USER PASSWORD

To change the password, choose the **'SUPERVISOR PASSWORD or USER PASS-WORD "** option from the **CMOS SETUP UTILITY** menu and press Enter].

NOTE   Either **'Setup'** or "System" must be selected in the "Security Option" of the **BIOS FEATURES SETUP** menu (Refer to Figure 3-3 for the details)

If CMOS is corrupted or the option is not used, a default password stored in the ROM will be used The screen will display the following message

```
                    Enter Password:
```

Press the Enter key to continue after proper password is given

2   If CMOS is corrupted or the option was used earlier and the user wish to change default password, the **SETUP UTILITY** will display a message and ask for a confirmation

```
    -               Confirm Password:
```

3   After pressing the Enter key, (ROM password if the option was not used) or current password (user-defined password), the user can change the password and store new one in CMOS RAM A maximum of 8 characters can be entered

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3-9 IDE HDD AUTO DETECTION

The "IDE HDD AUTO DETECTION" utility is a very useful too especially when you do not know which kind of hard disk type you are using. You can use this utility to detect the correct disk type installed in the system automatically. **But now you can set HARD DISK TYPE** to Auto in the **STANDARD CMOS SETUP.** You do not need the "IDE HDD AUTO DETECTION" utility. The BIOS will Auto-detect the hard disk size and mode on display during POST.
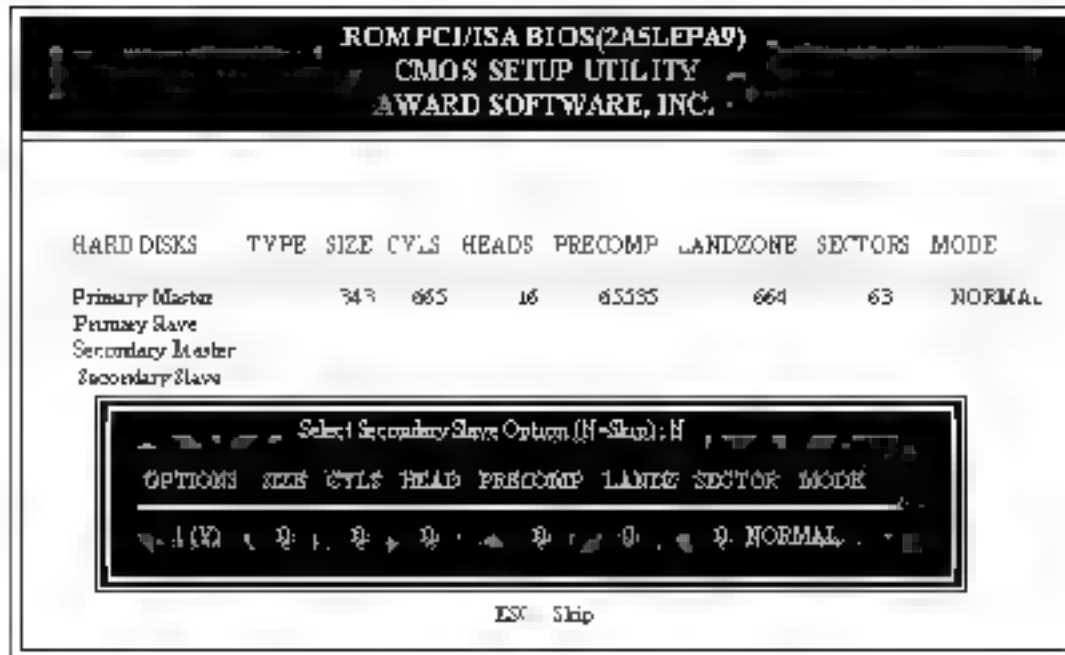

Figure 3-9 IDE HDD AUTO DETECTION

NOTE: HDD Modes

The Award BIOS supports 3 HDD modes: NORMAL, LBA and LARGE

NORMAL mode

Generic access mode that is neither the BIOS nor the IDE controller will make transformations during accessing

The maximum numbers of cylinders, head & sectors for NORMAL mode are 1024, 16 and 63.

$$no. Cylinder \qquad 1024$$
$$x \ no. Head \qquad 16$$
$$x \ no. Sector \qquad (\ 63$$
$$x \ no. per sector \qquad 512,$$
$$528 \ Megabytes$$

If an user sets the HDD to NORMAL mode, the maximum accessible HDD size will be 528 Megabytes even though its physical size may be greater than that

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LBA (Logical Block Addressing) mode This is a new HDD accessing method to overcome the 528 Megabyte bottleneck.

The number of cylinders, heads and sectors shown in the setup may not be the number physically contained in the HDD.

During the HDD accessing, the IDE controller will transform the logical address described by sector, head and cylinder into its own physical address inside the HDD.

The maximum HDD size supported by LBA mode is 8.4 Gigabytes which is obtained by the following formula.

```
    no. Cylinder     (1024
x  no. Head          255
x  no. Sector        63
x  bytes per sector  512)
      8.4 Gigabytes
```

LARGE mode This is an extended HDD access mode supported by Award Software.

Some IDE HDDs contain more than 1024 cylinders without LBA support (in some cases, user does not want LBA). The Award BIOS provides another alternative to support these kinds of LARGE mode.

CYLS.	HEADS	SECTOR	MODE
1120	16	59	NORMAL
560	32	59	LARGE

BIOS tricks DOS (or other OS) that the number of cylinders is less than 1024 by dividing it by 2. At the same time, the number of heads is multiplied by 2. A reverse transformation process will be made inside INT 12h in order to access the right HDD address.

Maximum HDD size.

```
    no. Cylinder     (1024
x  no. Head          ( 32
x  no. Sector        63
x  bytes per sector  512)
      1 Gigabytes
```

Note

To support LBA or LARGE mode of HDDs. there must be some softwares involved. All softwares are located in the Award HDD Service Routine INT 13h. It may fail to access a HDD with LBA (LARGE) mode selected if you are running under on Operating System which replaces the whole INT 13h. UNIX operating systems do not support either LBA or LARGE and must utilize the Standard mode. UNIX can support drives larger than 528MB.

3-10 HDD LOW LEVEL FORMAT

Interleave

Select the interleave number of the hard disk drive that you wish to perform a low level format on. You may select from 1 to 8. Check the documentation that came with the drive for the correct interleave number or select 0 for automatic detection.

Auto scan bad track

This allows the utility to scan first then format by each track.

Start

Press <Y> to start low level format.

3-11 SAVE & EXIT SETUP

The "SAVE & EXIT SETUP" option will bring you back to boot up procedure with all the changes you just recorded in the CMOS RAM.

3-12 EXIT WITHOUT SAVING

The 'EXIT WITHOUT SAVING' option will bring you back to normal boot up procedure without saving any data into CMOS RAM. All old data in the CMOS will not be destroyed.

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Chapter 4
Technical Information

4 1 I/O & MEMORY MAP

MEMORY MAP

Address Range	Size	Description
[00000-7FFFF]	512K	Conventional memory
[80000-9FBFF]	27K	Extended Conventional memory
[9FC00-9FFFF]	1K	Extended BIOS data area if PS/2 mouse is installed
[A0000-C7FFF]	160K	Available for Hi DOS memory
[C8000-DFFFF]	96K	Available for Hi DOS memory and adapter ROMs
[E0000-EFFFF]	60K	Available for UMB
[EF000-EFFFF]	4K	Video service routine for Monochrome & CGA adaptor
[F0000-F7FFF]	32K	BIOS CMOS setup utility
[F8000-FCFFF]	20K	BIOS runtime service routine (2)
[FD000-FDFFF]	4K	Plug and Play ESCD data area
[FE000-FFFFF]	8K	BIOS runtime service routine 1

I/O MAP

[000-01F]	DMA controller (Master)
[020-021]	INTERRUPT CONTROLLER Master
[022-023]	CHIPSET control registers I/O ports
[040-05F]	TIMER control registers
[060-06F]	KEYBOARD interface controller 8042
[070-07F]	RTC ports & CMOS I/O ports
[080-09F]	DMA register
[0A0-0BF]	INTERRUPT controller (Slave)
[0C0-0DF]	DMA controller Slave
[0F0-0FF]	MATH COPROCESSOR
[1F0-1F8]	HARD DISK controller
[278-27F]	PARALLEL port 2
[2B0-2DF]	GRAPHICS adapter controller
[2F8-2FF]	SERIAL port 2
[360-36F]	NETWORK ports
[378-37F]	PARALLEL port
[3B0-3BF]	MONOCHROME & PARALLEL port adapter
[3C0-3CF]	EGA adapter
[3D0-3DF]	CGA adapter
[3F0-3F7]	FLOPPY DISK controller
[3F8-3FF]	SERIAL port 1

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4-2 TIME & DMA CHANNELS MAP

TIME MAP:	TIMER Channel 0	System timer interrupt
	TIMER Channel 1	DRAM REFRESH request
	TIMER Channel 2	SPEAKER tone generator

DMA CHANNELS	DMA Channel 0	Available
	DMA Channel 1	Onboard ECP (Option)
	DMA Channel 2	FLOPPY DISK (SMC CHIP)
	DMA Channel 3	Onboard ECP default
	DMA Channel 4	Cascade for DMA controller 1
	DMA Channel 5	Available
	DMA Channel 6	Available
	DMA Channel 7	Available

4-3 INTERRUPT MAP

| NMI | Parity check error |

IRQ (H/W)	0	System TIMER interrupt from TIMER 0
	1	KEYBOARD output buffer full
	2	Cascade for IRQ 8~15
	3	SERIAL port 2
	4	SERIAL port
	5	PARALLEL port 2
	6	FLOPPY DISK (SMC CHIP)
	7	PARALLEL port
	8	RTC clock
	9	Available
	0	Available
		Available
	2	PS/2 Mouse
		MATH coprocessor
	4	Onboard HARD DISK (IDE1 channel)
	5	Onboard HARD DISK (IDE2 channel)

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4 4 RTC & CMOS RAM MAP

RTC & CMOS		
	00	Seconds
	01	Second alarm
	02	Minutes
	03	Minutes alarm
	04	Hours
	05	Hours alarm
	06	Day of week
	07	Day of month
	08	Month
	09	Year
	0A	Status register A
	0B	Status register B
	0C	Status register C
	0D	Status register D
	0E	Diagnostic status byte
	0F	Shutdown byte
	10	FLOPPY DISK drive type byte
	11	Reserve
	2	HARD DISK type byte
	3	Reserve
	14	Equipment type
	5	Base memory low byte
	6	Base memory high byte
	17	Extension memory low byte
	18	Extension memory high byte
	9-2d	
	2E-2F	
	30	Reserved for extension memory low bytw
	3	Reserved for extension memory high byte
	32	DATE CENTURY byte
	33	INFORMATION FLAG
	34-3F	Reserve
	40-7F	Reserved for CHIPSET SETTING DATA

APPENDIX A: POST CODES

ISA POST codes are typically output to port address 80h

POST(hex)	DESCRIPTION

01-02 Reserved

■ Turn off OEM specific cache, shadow

03
1. Initialize EISA registers (EISA BIOS only)
2. Initialize all the standard devices with default values Standard devices includes
    -DMA controller (8237)
    -Programmable Interrupt Controller (8259)
    -Programmable Interval Timer (8254)
    -RTC chip

04 Reserved

05
1. Keyboard Controller Self Test
2. Enable Keyboard Interface

06 Reserved

07 Verifies CMOS's basic R/W functionality

C1 Auto detection of onboard DRAM & Cache

C5 Copy the BIOS from ROM into E0000-FFFFF shadow RAM so that POST will go faster

08 Test the first 256K DRAM

09 OEM specific cache initialization (if needed)

0A
1. Initialize the First 32 interrupt vectors with corresponding Interrupt handlers
    Initialize INT no from 33-120 with Dummy Spurious
    Interrupt Handler
2. Issue CPUID instruction to identify CPU type
3. Early Power Management initialization OEM specific

0B
1. Verify the RTC time is valid or not
2. Detect bad battery
3. Read CMOS data into BIOS stack area
4. PnP initializations including (PnP BIOS only)
    Assign CSN to PnP ISA card
    Create resource map from ESCD
5. Assign IO & Memory for PCI devices (PCI BIOS only)

POST(hex)   DESCRIPTION

0C   Initialization of the BIOS Data Area (40:0N - 40:FF)

0D   1. Program some of the Chipset's value according to Setup. (Early Setup Value
                 Program)
                2. Measure CPU speed for display & decide the system clock speed
                3. Video initialization including Monochrome, CGA, EGA/VGA. If no display
                 device found, the speaker will beep

0E   1. Test video RAM (If Monochrome display device found)
                2. Show messages including.
                     Award Logo, Copyright string, BIOS Data code & Part No.
                     OEM specific sign on messages
                     -Energy Star Logo (Green BIOS ONLY)
                     -CPU brand, type & speed.
                     Test system BIOS checksum (Non-Compress Version only)

0F   DMA channel 0 test

10   DMA channel 1 test

11   DMA page registers test

12-13   Reserved

14   Test 8254 Timer 0 Counter 2

15   Test 8259 interrupt mask bits for channel 1

16   Test 8259 interrupt mask bits for channel 2

17   Reserved

18   Test 8259 Functionality

1A-1D   Reserved

1E   fEISA NVM checksum is good, execute EISA initialization (EISA BIOS only)

1F-29   Reserved

30   Detect Base Memory & Extended Memory Size

31   1. Test Base Memory from 256K to 640K
                2. Test Extended Memory from 1M to the top of memory

POST(hex)	DESCRIPTION

32
    1 Display the Award Plug & Play BIOS Extension message (PnP BIOS only)
    2 Program all onboard super I/O chips (if any) including COM ports, LPT ports, FDD port ... according to setup value

33-3B
    Reserved

3C
    Set flag to allow users to enter CMOS Setup Utility

3D
    1 Initialize Keyboard
    2 Install PS2 mouse

3E
    Try to turn on Level 2 cache
    Note: Some chipset may need to turn on the L2 cache in this stage. But usually the cache is turn on later in POST 61h.

3F-40
    Reserved

BF
    1 Program the rest of the Chipset's value according to Setup. (Later Setup Value Program)
    2 If auto-configuration is enabled, programmed the chipset with pre-defined Values

41
    Initialize floppy disk drive controller

42
    Initialize Hard drive controller

43
    If it is a PnP BIOS, initialize serial & parallel ports

44
    Reserved

45
    Initialize math coprocessor

46-4D
    Reserved

4E
    If there is any error detected (such as video, kb ...), show all the error messages on the screen & wait for user to press <F1> key

4F
    1 If password is needed, ask for password
    2 Clear the Energy Star Logo (Green BIOS only)

50
    Write all CMOS values currently in the BIOS stack area back into the CMOS

51
    Reserved

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POST (hex) DESCRIPTION

52
    1. Initialize all ISA ROMs
    2. Later PCI initializations (PCI BIOS only)
        assign IRQ to PCI devices
        initialize all PCI ROMs
    3. PnP initializations (PnP BIOS only)
        assign IO, Memory, IRQ & DMA to PnP ISA devices
        initialize all PnP ISA ROMs
    4. Program shadows RAM according to Setup settings
    5. Program parity according to Setup setting
    6. Power Management Initialization
        Enable/Disable global PM
        APM interface initialization

53
    1. If it is NOT a PnP BIOS, initialize serial & parallel ports
    2. Initialize time value in BIOS data area by translate the RTC time value into
      a timer tick value

60
    Setup Virus Protection (Boot Sector Protection) functionality according to Setup
    setting

61
    1. Try to turn on Level 2 cache
      Note: If L2 cache is already turned on in POST 3D, this part will be skipped.
    2. Set the boot up speed according to Setup setting.
    3. Last chance for Chipset initialization
    4. Last chance for Power Management initialization (Green BIOS only)
    5. Show the system configuration table

62
    1. Setup daylight saving according to Setup value
    2. Program the NUM Lock, typematic rate & typematic speed according to Setup
      setting

63
    1. If there is any changes in the hardware configuration, update the ESCD
      information (PnP BIOS only)
    2. Clear memory that have been used
    3. Boot system via INT 19H

FF
    System Booting. This means that the BIOS already pass the control right to the
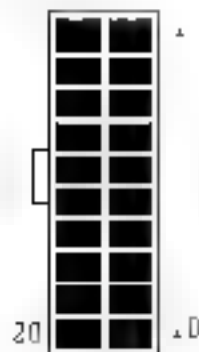   operating system

Unexpected Errors:

POST (hex) DESCRIPTION

B0
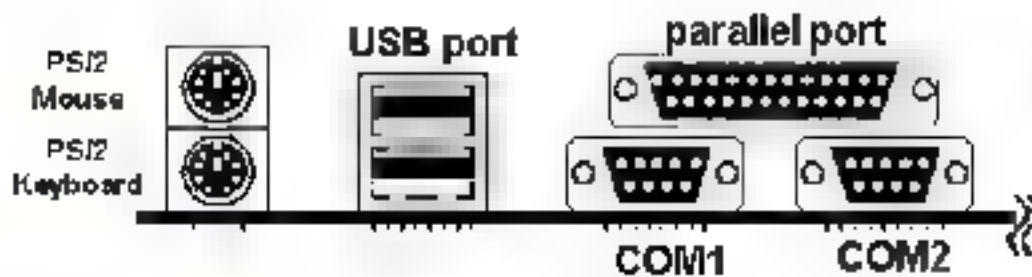   If interrupt occurs in protected mode

B1
    Unclaimed NMI occurs

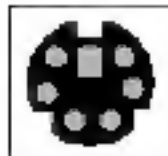# APPENDIX B: CONNECTORS

ATX Power Supply Connector

Signal Name	Pin	Pin	Signal Name
3.3V	1	1	3.3V
2.0V	2	2	3.3V
GND	3		GND
PS ON	4	4	5.0V
GND	5	5	GND
GND	6	6	5.0V
GND	7	7	GND
5.0V	8	8	PW OK
5.0V	9	9	5VSB
5.0V	20	10	2.0V

I/O back pannel connector:

PS/2 KEYBOARD & MOUSE CONNECTOR:

Pin	Signal Name
1	Data
2	Clock
3	GND
4	NC
5	VCC

COM1,COM2 : Serial Ports Connector
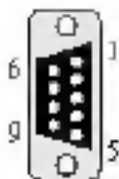
Signal Name	Pin	Pin	Signal Name
DCD	1	6	DSR
SIN	2	7	RTS
SOUT	3	8	CTS
DTR	4	9	RI
GND	5		

LPT1 : Parallel Port Connector
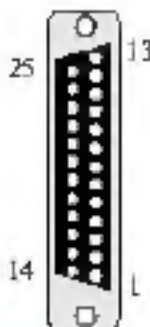
Signal Name	Pin	Pin	Signal Name
STROBE-	1	14	AUTO FEED-
Data Bit 0	2	15	ERROR-
Data Bit 1	3	16	INIT-
Data Bit 2	4	17	SLCT IN-
Data Bit 3	5	18	Ground
Data Bit 4	6	19	Ground
Data Bit 5	7	20	Ground
Data Bit 6	8	21	Ground
Data Bit 7	9	22	Ground
ACJ-	10	23	Ground
BUSY	11	24	Ground
PE	12	25	Ground
SLCT	13		

FDD1 : Floppy Disk Connector
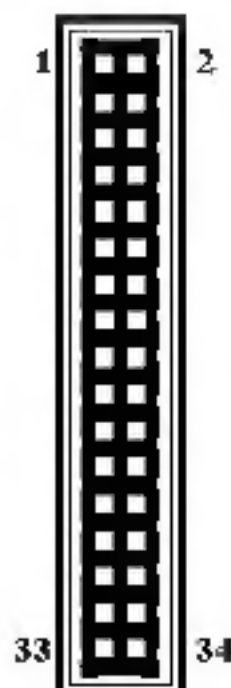
Signal Name	Pin	Pin	Signal Name
Ground	1	2	FDHDIN
Ground	3	4	Reserved
Ground	5	6	FDEDIN
Ground	7	8	Index-
Ground	9	10	Motor Enable
Ground	11	12	Drive Select B-
Ground	13	14	Drive Select A-
Ground	15	16	Motor Enable
Ground	17	18	DIR-
Ground	19	20	STEP-
Ground	21	22	Write Data
Ground	23	24	Write Gate
Ground	25	26	Track 00-
Ground	27	28	Write Protect-
Ground	29	30	Read Data-
Ground	31	32	SIDE 1 SELECT-
Ground	33	34	Diskette

IDE1,IDE2 : Primary, Secondray IDE Connector
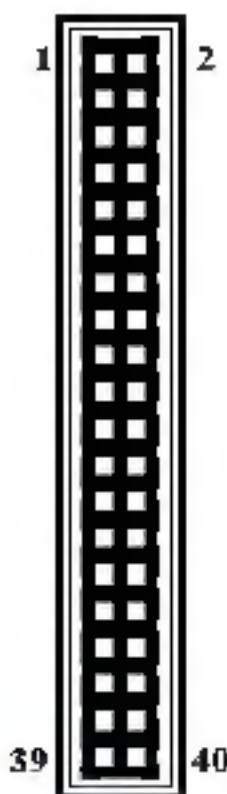
Signal Name	Pin	Pin	Signal Name
Reset IDE	1	2	Ground
Host Data 7	3	4	Host Data 8
Host Data 6	5	6	Host Data 9
Host Data 5	7	8	Host Data 10
Host Data 4	9	10	Host Data 11
Host Data 3	11	12	Host Data 12
Host Data 2	13	14	Host Data 13
Host Data 1	15	16	Host Data 14
Host Data 0	17	18	Host Data 15
Ground	19	20	Key
DRQ3	21	22	Ground
I/O Write-	23	24	Ground
I/O Read-	25	26	Ground
IOCHRDY	27	28	BALE
DACK3-	29	30	Ground
IRQ14	31	32	IOCS16-
Addr 1	33	34	Ground
Addr 0	35	32	Addr 2
Chip Select 0-	37	38	Chip Select 1-
Activity	39	40	Ground

Appendix C : AGP Driver for Windows 95 Installation Guide

This section provides the information for installation of Apollo VP3 VxD Driver which supports Accelerated Graphics Port (AGP) functionalities

SYSTEM REQUIREMENTS
1.Microsoft Windows 95 OSR2.1 (OSR2.0 with USB upgrade)
2.VIA Apollo VP3 AGP Driver (Vgart.VXD)
3.AGP VGA Card with Driver
4.DirectX5 DDk or SDK

INSTALLATION PROCEDURE
Step 1. Install Windows 95 4.00.950 B or later version
Step 2. Install USBSUPP (USB upgrade)
Step 3. Install Apollo VP3 AGP Driver
    -run the program "SETUP.EXE" which can be found in the VIA VxD driver
    disk and this process will then automatically install the VIA VxD driver onto
    your windows 95 system
Step 4 Install VGA driver for Windows 95
Step 5. Install Microsoft DirectX5 DDK or SDK.

NOTES
1 This driver should be installed on a system with the VIA Apollo VP3 AGP chipset while other chipsets is not be supported. The VIA VxD Driver is only supported by Windows 95 OSR 2.0 (4.00.950 B) ro later versions
2 For Win95 users, you will need to
    a. Get "USBSUPP.EXE" from Microsoft (www.microsoft.com), which includes the USB supplement and a new memory manager (VMM32.VxD) needed for the AGP DIME (Direct Memory Execute) feature
    b. Get DirectX 5.0 from Microsoft (www.microsoft.com). DirectX 5.0 is the first DirectX version that supports AGP's DIME.
    c. Get "VIAGART.VXD", a virtual device manager which is usually installed during the installation procedure of the Windows 95 card driver
3. To make sure if the Apollo VP3 AGP driver is properly installed, one must boot the Windows 95 system up and run "Regedit" and check whether the file VIAGART exists in the following path
"HKEY_LOCAL_MACHINE\System\CurrentControlSet\Services\VxD
4. To check whether the AGP driver is able to activate, one must do the following:
    a. Activate the "Control Panel"

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b. Click on "Direct X" then

c. Click on "Direct Draw" and

d. Check if there are some values existing in the "Bit" and "overlays."
   if there is, that means the AGP can be activated properly.

REPLACING AN EXISTING VGA CARD WITH THE AGP VGA CARD

1. Shut down the computer and then turn off the power

2. Replace the VGA card boot up the system once again

3. Now, Update Device Driver Wizard Window will appear This wizard will complete the installation of the Standard PCI Graphics Adapter (VGA)
   Click Next > to let Windows search for an updated driver

WARING ! Only click Next >. The system will hang if you click Cancel!

4. Click Finish to install the VGA driver You will then be asked for your Windows 95 CD in order to complete the VGA driver installation. If you do not have your CD handy, direct the installation path to your \windows\system directory. Windows will prompt you to restart your windows Chose "NO" and install the appropriate AGP VGA Driver

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